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A Monthly Journal

OF

NATURAL HISTORY,

FOR

RECORDING FACTS AND ANECDOTES

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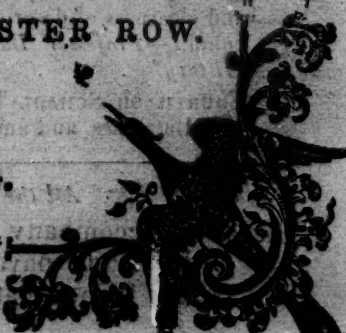
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M.DCCC.LXVIII.

Say, why does Man, while to his opening sight
Each shrub presents a source of chaste delight,
And Nature bids for him her treasures flow,
And gives to him alone his bliss to know,
Why does he pant for Vice's deadly charms?
Why clasp the syren Pleasure to his arms,
And suck deep draughts of her voluptuous breath,
Though fraught with ruin, infamy and death?
Could he who thus to vile enjoyment clings
Know what calm joy from purer sources springs:
Could he but feel how sweet, how free from strife,
The harmless pleasures of a harmless life,
No more his soul would pant for joys impure,
The deadly chalice would no more allure,
But the sweet potion he was wont to sip
Would turn to poison on his conscious lip.
Fair Nature! thee in all thy varied charms,
Fain would I clasp for ever in my arms!
Thine are the sweets which never, never sate,
Thine still remain through all the storms of fate.

HENRY KIRKE WHITE.



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THE ZOOLOGIST

FOR

1868.

Notes from Flamborough. By JOHN CORDEAUX, Esq.

(Continued from Zool. S. S. 1011.)

October 15. A narrow rocky beach, exposed at low water, skirts the foot of the headland. This reef is covered with a dense mattress of sea-tangle and bladder-weed, broken up and intersected by narrow channels and pools of salt and brackish water, for several fresh-water springs rise between high and low-water marks. Many of these rock-pools contained fish, sand-launce and a small species of goby, and several of those ferocious-looking little monsters, *Cottus scorpius*. I made several attempts to capture some sand-launce, and was invariably baffled by the nimble little fish burying themselves in the sand, which feat they accomplished with amazing dexterity. Myriads of sea-snails (*Nerita*) were crawling over the dank sea-tangle. The common dog-whelk (*Nassa reticulata*) is everywhere extremely abundant, and makes sad inroads into the mussel preserves. These mussels, which are used for baiting the fishing-lines, are brought from the Norfolk coast. The native mussel, found on these rocks near low-water mark, is extremely small and quite unfit for bait. Great pains are taken to keep these imported mussels safe from the attack of the dog-whelk, and women and children are employed, from time to time, in picking off these predacious mollusks, otherwise every shell would in time be emptied of its contents. On looking over one of these beds I found several of these destructive whelks quietly at work, closely attached to the bivalves. They bore a minute and perfectly circular hole through his hard shell, through which they suck out the life and substance of the helpless creature. Saw but few birds on the shore this morning, except the lively rock pipit (here particularly abundant), kittiwakes, hooded crows and a scoter.



October 16. Flamborough is remarkable for the number of rare birds shot in the neighbourhood. Notices of many of these captures appear from time to time in the 'Zoologist.' A considerable proportion of the land on this headland is strictly preserved, consequently, I have little doubt, many a rare visitor escapes undetected. A large owl chequered all over black and white, and, as the man said, "as large as a great blackbacked gull," was seen in a turnip-field on the 14th. The man who saw it went home instantly for his gun; on his return, however, the bird had disappeared—otherwise I might possibly have added *Surnia nyctea* to the Avifauna of Flamborough. I have no doubt if this place, like that wonderful little island Heligoland, possessed its Professor Blasius and Herr Gätke, with free permit to wander where they wished, many a rare visitor to our shores would be registered. In the 'Zoologist' (S. S. 541) mention is made of a small flock of shore larks seen during the spring of 1866. This flock, I am informed, numbered twelve birds; they were found in a grass field on the coast, near the highest portion of the Speeton Cliffs: they were very shy and wild, and it was after much difficulty and driving that two were shot, the remainder of the flock escaping, and I believe were not afterwards seen.

Mr. Roberts (Zool. S. S. 947), writes that this summer two pairs of peregrine falcons nested at Flamborough. I made particular inquiries about these eyries, and found that one nest had been plundered by some cliff-climbers. The other pair were more fortunate, and escaped unmolested, the young birds getting off.

That portion of the coast uncovered at low water, to the west of the northern landing-place, presents many attractions. The marine zoologist will here find ample employment in exploring the numerous clear and deep pools left by the receding tide. This limestone reef presents a curious appearance to the eye, as nearly every exposed portion of the rock is pitted with holes of various depth and size, and has a curious reticulated appearance, like a gigantic piece of lace-work. These shallow pits are the work of the limpet, here found in myriads; the rock is everywhere studded with their conical houses. If we pick off one of these limpets we find that it is slightly sunk below the rock surface, in a shallow pit the exact size of its own shell: the bottom of this little pit is tinged a light green colour, as if acted upon by some chemical substance. These shallow pit-marks cover every available space. The waves in time break down and wear away the narrow walls left between these pits; other limpets again attach themselves to the bottom of these shallow troughs, and thus in time

the rock is slowly eaten out. At last a pebble gets lodged in the cavity; every wave which then washes over the rock rolls it round its prison-house; thus these wonderful rock-basons are formed—perfect natural aquariums, their sides either smooth and polished, or fringed with delicate Algæ and pink corallines. In the round pebbles at the bottom we see the rude but effectual tools of the wave. Many of the larger pools contain fish. The water in these pools is wonderfully clear and transparent, their sides and bottom a garden of beauty, fringed with tangle and the waved blades of the oarweed, the beautiful tufts of the *Chondrus crispus*, bunches of *Fuci*, brown, pink and purple, and clusters of the pale green *Ulva*. I observed many fish darting in and out or hiding amongst these sea-weeds, and in one pool close under the cliff the common shanny: two of these little fish were basking in the sun, in the shallows near the edge of the pool, their backs barely covered with water.

On returning to the north landing I found several fishing-boats had arrived: they contained cod, haddock, ling, skate, pollack, whiting, conger and a few ballan wrasse, also an occasional large crab taken on the lines, and in one boat numbers of star-fish, amongst which I noticed some fine specimens of *Solaster papposa*. It is a pity that Flamborough possesses no marine zoologist, as rare fish are sometimes brought in by the boats. I saw at the house of Mr. Bailey a drawing, in coloured chalks, of a fish captured off this coast two or three years since. From this sketch and the description given I had no difficulty in recognizing the rare filefish (*Balistes capriscus*). A fish-salesman informed me that a similar fish was taken this year, and had been sent to Manchester, where, as he said, "nobody had seen the loike afore." He thought it was a "sort o' sun-fish." Mr. Couch, in his 'Fishes of the British Isles,' mentions only three instances in which this rare fish has been captured in British seas—all on the southern coast.

When picking off with my knife some of the larger limpets from the rocks, this morning, in order to examine them, I found coiled up beneath the foot of one a curious-looking worm. It was about two and a half inches long, very slender, and had considerable power of elongating the body: pale sea-green colour; a minute fringe like small feet running down each side underneath. On leaving the limpet-shell it glided away over the wet rock with great ease. From its position beneath the limpet I thought it might probably belong to some species allied to that curious parasite *Lepidonotus Lordi*, described by Mr. J. K. Lord as lodging within the shell of the keyhole

limpet of Vancouver's Island. I find, however, since my return from Flamborough, that it answers the description given of the marine worm known to zoologists as *Phyllodore viridis*. It is singular that it should be found under the limpet, as the rock was perfectly smooth at the place of attachment, and, as far as I could perceive, there was no orifice by which it could have inserted itself beneath the shell. Near this north landing-place the geologist will find some good sections of the upper chalk formation, intersected at intervals with narrow belts of flint, as regular as if laid down by rule and plummet. The lower belt of flint, which is about a foot in thickness, and every tide washed by the waves, is stained a beautiful rich purple-brown, sometimes green or yellow. The limestone immediately in connexion with this bed does not exhibit any of this rich colouring, which seems to be peculiar alone to the lower chalk belt. In some instances this colouring matter appears to extend below the surface of the stone. Have any of my readers observed the same thing? and is this colouring matter attributable to the action of the salt water on the rock, or in any way connected with minute marine vegetation? I enclose a small portion of the coloured flint for Mr. Newman's inspection.

I went out this evening in a herring-boat from the south landing-place, which opens into Bridlington Bay. The bay herring fishery begins about the commencement of October and is continued often till Christmas, the boats going out for the night, often in very rough and inclement weather; occasionally, as the poor fellows said, everything in the boat covered with snow. On this occasion we crossed the bay till opposite the Bridlington Lights, and at the turn of the tide shooting the nets, and allowing nets and boat to drift; and thus hour after hour we slowly drifted seawards, without any very striking incident to narrate. Once a porpoise came wallowing past, and soon after a flock of wild geese passed flying southward. Several times after dark I heard the notes of small birds passing over. I thought I could make out the note of the lark; sometimes it was a wild and inexpressibly mournful note, which I failed to recognise. The hauling in of the net is an interesting sight, every mesh glittering with phosphoric sparks, like a stream of fireflies pouring in over the gunwale, the herrings gleaming like bars of silver. I noticed that these phosphoric gleams continued some time after the net was taken out of the water: after we had landed, in hauling the nets from the boat, they still continued to emit phosphoric sparks.

I must now bring my paper to a conclusion, trusting my readers will have found something to interest them in these rough "Flamborough Notes." I am informed that since my visit the pomarine skua, little gull and little auk have been shot at Flamborough.

JOHN CORDEAUX.

November 28, 1867.

Erratum.—There is a very obvious error in my "Flamborough Notes" (Zool. S. S. 1008, line 11); for "A year has passed," read "Ages have passed."—J. C.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from Zool. S. S. 946.)

SEPTEMBER, OCTOBER AND NOVEMBER, 1867.

Knot (*Tringa islandica*).—September 18. First flock of knots observed on the flats.

Jack Snipe.—September 26. First seen, an unusually early appearance. I shot a jack snipe to-day in a turnip-field on the Wolds, in a very dry and exposed situation, and some considerable distance from the nearest water.

Dunlin.—September 28. Many thousands of dunlins, evidently fresh arrivals, have appeared on the flats during the last week. When the flats are covered by the tide, they then usually resort to the nearest ploughed lands. Nineteen dunlins killed this afternoon, for examination, were in transition plumage, and exhibited more or less traces of their black partial summer plumage.

Rook.—October 1. Have on several occasions lately, in early morning, observed flocks of rooks on the hawthorns in the marsh, eagerly consuming the haws; some of these bushes are stripped of their fruit by these enterprising foragers. They are now evidently driven to great straits to obtain a meal, their "happy hunting grounds" having been long closed from the long-continued drought. Some of the most determined have levied "black mail" on the corn already cut and "stooked." This I consider a most unusual occurrence, their depredations in this district invariably ceasing with the cutting of the crops.

Waterhen.—Are this autumn unusually plentiful on our streams, "blow-wells" and drains, which fact, I trust, betokens a good wild

duck season, as ducks will drop in those places where they perceive water-fowl swimming. I lately observed a mallard, flying across the low grounds, drop very suddenly and unexpectedly in the stream. On going up to the place I shot him as he rose, and at the same time the decoy, a little grebe, sought safety under water.

Common Snipe.—October 6. Considerable numbers arrived during the last few days. There is a peculiarity about these early arrivals of snipe: we at first seldom find them near water, almost invariably in dry situations, in pasture-land amongst the long grass or on stubbles. When flushed they fly slowly and lazily, a flight more resembling that of a peewit than their usual rapid and erratic pace later in the season. I have often thought that these birds are recent arrivals, and like the woodcock, when they first reach land, will drop anywhere, requiring a few days' rest before recovering their characteristic flight and habits. These early snipe are always very fat. If the weather remains fine and open they very soon depart, and in that case we seldom see snipe again before the first severe frost.

Hooded Crow.—October 1 to 7. Arrived on the East coast, in all their usual winter haunts, during the first week in this month.

Green Sandpiper.—October 9. Note the first appearance on our small stream. Have since this date seen several. To-day (November 18th) put up three altogether from a bend in the "beck."

Redwing, Fieldfare and Missel Thrush.—November 18. The dogs put up several redwings in the turnips to-day. I saw the fieldfare at Flamborough on the 14th. Several small flocks of missel thrushes observed in the lowlands during the latter part of September and early in October. I have also observed some flocks of this species flying over the parish, often at a considerable height. These autumnal flights of thrushes are constantly mistaken for those of fieldfares, and hence notices of the early arrival of these birds we occasionally see recorded in the "local luminaries."

Woodcock.—Several seen during the first week in November in the Humber district, and I understand are plentiful in some localities in this county.

Pied Wagtail.—Have noted these wagtails on several occasions during the past month (November) in this neighbourhood.

Fulmar Petrel.—November 20. I received to-day, from the Rev. M. G. Watkins, of Barnoldby-le-Beck, a fine specimen of the Fulmar petrel. It was knocked down with a stick by a groom, in a turnip-field at Barnoldby, on Monday, the 18th, apparently unable to fly:

the man, not knowing its value, pitched it into the ditch. The parish ratcatcher, hearing of the bird, went the next morning to get it for his ferrets; however, it stunk so, as he said, that he dare not use it for that purpose, but, noticing the curious bill of the "gull," carried it home on the end of a pointed stick and exhibited it to the rector, who at once recognized it as a rare capture. A large bird was shot in the same parish about six weeks since; unfortunately the skin was destroyed: from the description given me I have no doubt it was a gannet. In my idea the strong smell peculiar to the Fulmar petrel is anything but disagreeable: I found it impossible to distinguish it from musk.

White Starling and Pied Blackbird.—I saw to-day (November 23rd) a pure white starling, which was shot in this district. A friend informs me that he has lately frequently seen a pied blackbird in his garden: he described the entire back of the bird as pure white.

Wood Pigeon.—November 27. In the crop of a wood pigeon, shot this evening, I found several hundred grains of barley, a considerable quantity of the seeds of the common cow-parsnip (*Heracleum Sphondylium*), and several seeds of that troublesome weed the goose-grass (*Galium Aparine*).

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire,
December 4, 1867.

Ornithological Notes from West Sussex.

By W. JEFFERY, jun., Esq.

(Continued from Zool. S. S. 814).

JUNE—NOVEMBER, 1867.

House Martin.—Mr. Cordeaux remarks (Zool. S. S. 808) on the scarcity of house martins this year in his district, in Lincolnshire. I certainly cannot say the same of this immediate locality, for I have counted more than fifty nests around the eaves of one building. It is a curious fact that a species should suddenly become so scarce in certain districts. Some time ago Mr. Boulton recorded, in the pages of the 'Zoologist,' the scarcity of the swift in the neighbourhood of Beverley, in Yorkshire, and I do not remember that any satisfactory conclusion was arrived at as to the cause. May we not look either to their winter quarters on their passage thence or hence for a solution?

There is little doubt that as birds are known to return to the same parts here, year after year, that they also repair to the same in their wintering countries, and birds of a certain locality would probably migrate together. Is there not room then to suppose that some casualty had befallen the Lincolnshire martins, either in their winter quarters or in one or other of their migratorial movements? This granted, it may take several seasons to replenish the stock.

Swallow.—On the 15th of October, in the passage from Dieppe to Newhaven, I was surprised at seeing swallows crossing the channel in small and widely-scattered parties, instead of, as I had always imagined they did, in flock.

Stock Dove.—Some time in May I took a pair of young stock doves from a hollow yew tree on our Downs. They are still alive and doing well, and are now in full plumage, having completely moulted since. The moult was commenced about the middle of July and finished by the middle of October, the wing and tail-feathers being shed and renewed, and the metallic tinge on each side of the neck acquired. I first heard them "coo" on the 26th of June. Can any reader inform me if I may expect these birds to breed next year?

Reed Warbler.—The reed warbler is a locally-distributed species in Sussex, as probably in other counties, being, *as a rule*, found only amongst or in the neighbourhood of reed-beds, which in this division of Sussex are of infrequent occurrence. Adjoining our rivers, the Arun and the Adur, here and there, where the draining tool has not done its work, and in some of our larger ponds, these reed-beds are still to be found. At the Burton Ponds, near Petworth, I have this last June found the reed warbler breeding, and also at a small pond near Chichester. This last-named pond is not more, perhaps, than three-quarters of an acre in extent, three-fourths of it being a bed of reeds. Here I should say, at a guess, some eight or ten pairs of reed warblers breed annually, and it was here that the cuckoo's eggs were taken in 1864 (referred to Zool. 9211); here also I obtained a supply of reed warbler's eggs this year; after about an hour's wading considerably over knee-deep on the unsound bed of reed-roots, I came out with four nests containing eleven reed warbler's eggs and one cuckoo's. The reed warbler is a late breeder. At Burton only one of the nests found on the 1st of June was finished, and this with one egg in it. Near Chichester, on the 27th of June, some nests contained four eggs, others only two, but all quite fresh. The nests vary greatly in their formation, being much neater when sheep's wool is the

principal ingredient: one nest, which I have, is a double one, one having been built on the top of the other, giving it altogether a depth of eight inches. What can have been the motive for this? Perhaps the first nest was too near the water. The note of this species is, to my ears, more harsh and less varied than that of its relative, the sedge warbler, being composed almost entirely of the "chit, chit, churrit, churrit," often continued for a length of time, and without the imitated notes of other birds, which is so pleasing in the song of the sedge warbler.

Siskin.—July 3. I have just learned that a pair of siskins have this year built a nest, and hatched and reared their young, in the garden of the Vicar of Oving, near Chichester.

Meadow and Tree Pipits.—July 28. The meadow pipit is now migrating. Although this species breeds on and in the vicinity of our Downs, as well as on the sea-coast, even numerous on the bed of shingle between Pagham Harbour and the main sea, it is rarely that they do so in the flat lowlands intervening, and their "tit, tit, tit"—a note seldom heard in the breeding season—now sounds fresh and pleasing to the ear of the ornithologist. The tree pipit is heard passing over about the same time. I first noticed its sharp note on the 29th of July, and heard it frequently until the end of August.

Ray's Wagtail.—Passing over from the 11th of August until the 1st of September. Once heard as late as the 5th of October.

Sand Martin, Swift and Nightjar.—My note-book records the sand martin numerous, at various times from the 23rd of August to the 6th of October. A light-coloured (nearly white) specimen was shot here on the 31st of August, and is now in my collection. The other sand martins were mobbing it at the time it was shot. On the 28th of August I saw a solitary swift near Pagham Harbour, and on the 19th of September another, and also a nightjar at Bognor.

Sheldrake.—A bird of the year shot in Pagham Harbour about the 28th of August: it was in company with some domestic geese, and showed considerable reluctance in separating from them.

Ruff and other Waders.—An example of the ruff, in immature plumage, occurred at Pagham about the 28th of August. Other waders observed at this period were the oystercatcher, gray and ringed plovers, turnstone, knot, common sandpiper, redshank, dunlin, curlew sandpiper and little stint; also two little stints were shot there on the 1st of October. A blacktailed godwit at Bosham on the 11th of September.

Osprey.—September 16. An osprey shot at West Wittering, near Chichester: it was apparently a bird of the year: the feathers of the upper plumage edged with a lighter shade of brown, and the legs and feet lighter than in the adult bird: it measured five feet three inches from tip to tip of wing. About this time a second specimen was obtained at Littlehampton.

Jack Snipe.—Shot a jack snipe on the 7th of October. Seeing that this species is said not to breed in the British Isles, is not this an early arrival?

Sanderling.—November 6. Saw a sanderling, in winter plumage, which had been killed a few days before in Bosham Harbour: it is a species that I have rarely met with at this season in Sussex.

Snow Bunting.—November 25. Shot a female snow bunting on the beach at the mouth of Chichester Harbour. It is singular that the only specimen previously in my collection was killed at the same place. In the crop of the bird shot were two wheat-corns, some seeds of a rushy kind of grass growing on a sand-bank near, three small chrysalids, a fly (half an inch long) and two sandhoppers. In the gizzard a quantity of sand and small gravel.

Wild Fowl, &c.—November 25. Saw two sheldrakes, or "bier-ganders," as they are here called, in Chichester Harbour, as well as about a dozen Brent geese, bagging two of the latter and an immature specimen of the razorbill: the stomach of the latter was crammed with young smelts. A considerable number of widgeon have been killed, and I saw a female redbreasted merganser killed this day.

Rock Pipit.—November 25. Shot two rock pipits on a small island in Chichester Harbour, and was surprised to find, in the stomachs of both, bones and other remains of small fishes. It often happens that small gobies and other fishes, numerous there, are left by the receding tide to die and dry up, and in this case would be an easy prey to the pipits; otherwise it is difficult to imagine in what way their capture could be effected by these birds. In addition to these fishy remains were small seeds of several kinds.

Water Rail.—The water rail also is a fish-eater; three small "miller's-thumbs," or "bull-heads," were found in the stomach of one. I have noticed a variation in the plumage of this species, which at present I am unable to understand: I refer to a patch about an inch or less in diameter, black with white markings, on the lesser wing-coverts. In two *male* skins in my collection it is absent altogether;

in a *female*, shot on the 29th of October, it is well marked, and is also seen, though less prominently, in a *male* shot since. I should be glad of an explanation of this.

Ringed Plover.—The gizzard of a ringed plover contained a quantity of small marine univalve shell.

House Martin.—Nov. 27. To-day I saw four house martins in Chichester, apparently strong and active, but I fear the sharp frost of the following night found them out.

Falcon and Peewit.—Nov. 28. A farm-workman tells me that a few days ago his attention was attracted by a "large hawk" and a peewit high in the air above him. The hawk, which would appear from his description to have been a peregrine falcon, struck the peewit, and, as he says, carried it to the ground. He allowed some minutes to elapse, and perceiving no farther movement he walked up, when both birds rose, and the falcon, dashing again after the peewit, struck it into a hedge; here, though not dead, it was captured by the man and found to be severely cut about the breast.

Nesting of the Sedge Warbler.—In his interesting letter on "distinguishing characters" (Zool. S. S. 968), Mr. Harting states, as his own experience, I imagine, that the nest of the sedge warbler is placed on the ground. It has recently been shown, in the pages of the 'Zoologist,' that the reed warbler sometimes departs from its normal mode of nesting in reeds and builds its deep cup-shaped nest in lilac and other bushes, frequently at a distance from water and at a considerable elevation from the ground. Now in this district the sedge warbler places its nest, I may say almost invariably, at some height from the ground, perhaps on an average from one and a half to three feet, and I have found it at nearly four feet from the ground. It is also occasionally placed in low bushes over water. Several persons to whom I have mentioned this have expressed opinions that the habit is abnormal, and as such it is perhaps worth recording.

Chiffchaff and Willow Warbler.—In addition to Mr. Harting's "distinctive characters" in these birds, I will add that I have invariably found in the chiffchaff that the under parts of the feet, the soles, as it were, are yellow, while the same parts in the willow warbler match the general colouring of the legs, a fleshy brown.

W. JEFFERY, JUN.

Ratham, Chichester, December 4, 1867.

Letters on Variation in Lepidoptera. By EDWARD NEWMAN.

LETTER THE THIRD.—PAIRS OF SPECIES.

My dear Mr. Wollaston,—

My third epistle treats of a matter which has already caused much discussion, and will certainly cause much more before it is finally accepted or rejected by our fellow-labourers in the field of Science—I allude to the existence of *pairs* of species: and here I wish expressly to state that I employ the word “species” in its conventional and ordinary sense, and leave it a perfectly open question for future discussion, whether the moieties of the pairs to which I shall allude are species, races or varieties, or whether species have any absolute existence in Nature. Such questions are here avoided, because, however interesting and important as regards the science of Natural History, they would rather encumber and confuse the few simple views I am now endeavouring to express; but to my point.

It cannot escape the notice of the inquirer that natural groups of organized beings exhibit a tendency to a dichotomous division: this phenomenon is of frequent occurrence. Dr. Fleming, whose profound teachings in Zoology have never been sufficiently esteemed, was the first to point out the existence of this tendency; his only mistake was in assuming that a phenomenon which he saw so plainly portrayed on Nature’s face must involve the existence of an absolute law: he believed that all Nature’s laws were general; he carefully studied the seen, and imagined the unseen to be in exact accordance: now we may accept the axiom of the poet that Nature

“Acts not by partial but by general laws,”

without assuming that we possess a perfect knowledge of those laws; for instance, exceptions to natural laws may be of such frequent occurrence as to become laws themselves: it is an undoubted law that the females of our own race produce but one young one at a birth, nevertheless an exception occurs quite as regularly, that once in a certain number of births twins shall be produced: the exception by no means vitiates the rule; indeed, in my estimation, it would tend to establish the rule, but the exception must be regarded as having the same force as the rule which it contravenes, and must never be disregarded in our calculations or superseded by our inventions.

A few instances of these dichotomies at once force themselves on our notice. In the first place, organized beings are either animals or plants, and although we constantly meet with learned lecturers who raise objections to this obvious truism, and skilfully place a stumbling-block in their own way just to exhibit their ability to remove it, Nature takes no heed of their proceedings, but writes "plant" and "animal" on the forehead of each in characters so unmistakably plain that he who runs may read. The lecturer may talk of chemical tests, of the test of burning; he may immerse atoms in aquafortis or subject them to a white heat in order to ascertain their true character; it is all to little purpose, and we accept Nature's inscription in preference, and leave the lecturer to his experiments and his speculations.

I am often taught by the simple remarks of children how much of our labour is in vain. Sometimes I spend an hour or two in Regent's Park, where animals and plants have each their allotment of acres. One Thursday a learned professor at the Royal Botanic explained at great length the necessity of applying tests in distinguishing animals from plants; and a little boy who was my companion seemed

"To drink instruction with delighted ear."

We adjourned to the Zoo, where my juvenile friend enjoyed a ride on the elephant, and some time after he had dismounted he asked me, in perfect simplicity, "Mr. Newman, is the elephant an animal or a plant?" I saw of course what was going on in his juvenile brain, and told my youthful friend that in the case of such large creatures as elephants there could be no doubt; that we recognized them at once, instinctively, intuitively, and a little more in the same sagacious strain, and so I thought the matter was settled; but I could not escape so readily as this: when we reached the giraffes the subject was renewed by the inquiry, "Have the giraffes been calcined?" "No, certainly not, or we should not see them poking their noses almost in our faces as they are doing now." "Then you can't be *quite certain* whether they are plants or animals: Professor Smokey said so just now." I got out of the hobble as well as I could, but with a steadfast resolution never to take a child to hear another scientific lecturer. Nature herself was this boy's best instructor; philosophy only served to lead him astray. Animals and plants then are one of Nature's pairs, which even the learning of a professor will not serve to divorce.

The reptiles afford us another instance of a natural dichotomy. Cuvier, the great apostle of our Science, regarded sucklers, birds,

reptiles and fishes, as four equivalent classes of endosteate animals, but subsequent writers have divided the reptiles into two classes, first to gratify a fiction, once fashionable, that Nature prefers the number five, and, secondly and more remotely, because there was an intrinsic difference in their mode of reproduction: this difference is a true one, but I have shown elsewhere that it obtains also in sucklers, birds and fishes.* The difference is most strongly pronounced in fishes: it has its second degree of development in reptiles; its third in birds; and its fourth in sucklers. It is very interesting to observe how beautifully similarities develop themselves in the component parts of these dichotomous divisions as soon as this principle is understood: it is only necessary to glance at a lizard and a salamander, both comprised by Linneus in the genus *Lacerta*, but totally different in physiological characters, to appreciate and understand the whole theory of pairs. Two beings enter on life side by side, totally different from each other, and having a different external form, a different system of circulation and respiration, eating different food, the one aquatic, the other terrestrial, yet approaching each other hour by hour, week by week, until they become, in the estimation of a Linneus, members of the same genus, *Lacerta*.

It is exactly thus amongst insects; they commence life differently and end it alike, so truly alike that it is the pleasure, I may say the vocation, of some entomologists, to insist they are identical; and in those few instances in which this assertion is not made, as in the case of *Psi* and *tridens*, it is because these have, from long custom, acquired a prescriptive right to specific rank, not because any specific diagnosis has ever been proposed.

These natural dichotomies contrast in the most striking manner with scientific dichotomies, of which there is none more popular than those consisting of a positive and a negative; even such dichotomies are truthful but vague, like the poet's division of the world into two moieties:

"The one that small
Beloved and consecrated spot
Where Leah was, the other all
The dull wide waste where she was not."

One moiety will be acknowledged to be clear and definite, the other vague, indefinite, and somewhat too comprehensive for our just apprehension.

* 'Essay on the Physiological Classification of Animals.' Van Voorst, 1852.

Of these false, or as they are termed scientific, dichotomies there are two preeminently popular. By this principle Lepidoptera are divided into Rhopalocera and *Heterocera*; animals into vertebrate and *invertebrate*. Let us glance at these dichotomies only for a moment. *First*, that of Lepidoptera into Rhopalocera and Heterocera,—Rhopalocera conveys in its very name the expression of a character, and *Heterocera* equally implying the want of a character. *Secondly*, an exactly parallel instance is the dichotomous division of animals into vertebrate and *invertebrate*; the *haute école* of Science roll out these terms with great power of voice and immeasurable self-complaisance; but Nature fails to acknowledge them: as well might we divide animals into hairy and *not-hairy*, or feathered and *not-feathered*: such terms as *vertebrate*, *hairy* and *feathered* express positive characters, but no group can be based on the *non-possession* of these characters—a fact that must be only too obvious to every one who gives the subject a fair share of consideration.

Not only do these dichotomies, founded on a positive and a negative, find no support in Nature, but they have another fault equally embarrassing to the student: they give a measure—a small but notable measure—of character to one moiety of the pair, yet leave the other moiety a perfect chaos, and do not afford us the slightest clew to the arrangement or subdivision of its contents.

Now exactly such dichotomies as we find in kingdoms—I accept the term as prescriptive, not for its merits—exactly such do we find in all minor divisions known as provinces, classes, orders, families, genera and so forth, until we arrive at those species where the present inquiry properly begins; and here I would extend a word of caution to those who really desire to investigate the subject: let no one assume the universality of the law, since all that can be done in our present state of ignorance is to follow out these dichotomies where we see traces of their existence, and thus acquire such an amount of knowledge as shall dissipate that ignorance, and it is of the utmost importance that we take nothing for granted, that we assume nothing, that we test everything by repeated experiment.

I will select half a score examples from as many families to illustrate my meaning, and bring it more immediately under the notice of my readers, and I wish to invite especial attention to the fact that the moieties of each pair are produced under precisely parallel circumstances; that climatal or geographical or seasonal conditions have no influence over them; that they may be produced at the same hour,

may feed on the same leaf, and may never wander from the same garden. I do not say that these conditions are necessary, but merely that the pairs will unquestionably bear the test of the most rigid restrictions to similar conditions. The examples I select are by no means the best I could find. No. 1 I have chosen on account of a peculiar interest attached to the discovery; the other nine because the abundance of the individuals in each case affords the inquirer such ample opportunity of testing the soundness of my views.

1. *Bombyx Spartii* and *B. familiaris*.—During the summer which has just passed away my friend Mr. Doubleday sent me the larva of a *Bombyx* which he had received from the Continent under the name of *B. Spartii*, which was totally different from any larva I had previously seen: M. Guenée had previously described both the larva and imago of *Bombyx Spartii*, and this was the larva in question. Hübner had previously figured the imago: Boisduval had both figured and described it; and Herrich-Schæffer describes it in his 'Systematische.' Our countryman Stephens makes five British species out of the section of *Bombyx* now under consideration, three of which, *Rubi*, *Trifolii* and *Quercus*, he considers good and veritable species; two others, *Medicaginis* and *Roboris*, he places within brackets, thus implying a doubt whether they be really species; under *Roboris* we find the *Bombyx Spartii* given as a variety, with references to Hübner's figures of both sexes: thus it appears from this, that Mr. Stephens, the most species-making of all entomologists, raises *Bombyx Spartii* to no higher rank than the variety of a variety, and it may be added that no permanent character has been pointed out whereby its imago can be distinguished from that of the insect I have next to notice.

Bombyx familiaris is a new name: it was *Bombyx Quercus*, and also familiarly known in England as the "Great Oak Eggar." The reason for the change of name is simply this, that our familiar insect is not the *Bombyx Quercus* of Linneus: we all know from the original description, from the habitat and from the Linnean specimen still extant, that the name of *Quercus* belongs of right to the insect we have within the last dozen years rechristened under the name of *Callunæ*.

The larvæ of *Spartii*, to which I have just alluded as received by Mr. Doubleday from France, underwent their metamorphosis and emerged as perfect insects in all respects identical with our *familiaris*. The larvæ are totally distinct, the moths perfectly identical.

In this as well as in the instances which follow, we must adopt one or the other of these two conclusions: *first*, that two perfectly distinct

species of larva are required to constitute one species of imago; or, *secondly*, that two species of Lepidoptera, entirely different in their preparatory stages, become precisely similar in their adult state. I accept the latter conclusion, and fully believe that pairs of species may in a thousand instances be so exactly alike in the imago state as to defy every effort to differentiate them. To all human perception this pair of species, when examined in their ultimate state, are absolutely identical.

2. *Boarmia rhomboidaria* and *B. perfumaria*.—I have had the pleasure of minutely examining, and most carefully describing, the larvæ of these two species. The differences between the two possess the invaluable attribute of constancy; neither ventures over its natural boundary line, whether in form, colour or food. Arrived at maturity, their similarity is so great that entomologists generally refuse to perceive any difference between them; but I cannot go quite so far as to say that none exists: those who like myself have repeatedly bred both from the egg, and closely scrutinized the adults as they entered on their winged existence, have observed differences which at the moment seemed to separate them, although soon to be lost after the moths have taken wing. The rhomboidaria of the Vienna Catalogue, of Hübner, Haworth, Duponchel, Guenée, &c., is correctly described by Guenée as *cendré-jaunâtre*, the dark cinereous ground-colour of the wings is suffused with a yellowish tint, while in the rhomboidaria of Stephens the colour is more uniformly cinereous and without any yellow tinge whatever. I should characterize this insect as *very* smoky, *perfumaria*: in accordance with its metropolitan habitat, it seems to be saturated with smoke: Guenée gives other characters of distinction, although he treats *perfumaria* only as a variety; he says it is a little larger, the fore wings are a little more pointed, and a little more prolonged at the tip; the pectinations of the antennæ are rather longer and are not appressed so closely on each other. Several writers, in a recently-established and highly scientific journal devoted exclusively to Entomology, also allude to both species in a manner that implies perfect familiarity with them.

3. *Cabera pusaria* and *C. rotundaria*.—In this instance we labour under a double difficulty: in the first place, *C. rotundaria*, in all its states, is very imperfectly known; and, in the second place, there is but little inclination exhibited to acquire a more perfect knowledge. In almost every cabinet certain individual insects are set apart from *Cabera pusaria* and are labelled "*rotundaria*." Haworth was the first

to characterize Rotundaria thus—" *Alis rotundatis albis fusco-subatomosis, strigis duabus medio communibus subundulatis plumbescentibus antica anticarum geminata.*" He gives no *descriptio*, and entirely omits all reference to Pusaria, which follows next in order, and under which, in like manner, there is no reference to Rotundaria: his character of Pusaria runs thus—" *Alis albis fusco-subatomosis strigis tribus medio æquidistantibus, subundulatis plumbescentibus ultimis communibus.*" It will be seen that the anterior striga on the fore wings of Rotundaria is double: at p. 85 of my 'British Moths' this character is well shown in two of the figures; in the other two there are but two *strigæ*, and neither of these is double; but this character occurs also in Pusaria, some specimens having one double and one single *striga*, others two single *strigæ*; the roundness of the wings therefore remains as the only constant and reliable character. Herrich-Schæffer dismisses Rotundaria without the slightest hesitation as one of the synonyms of Pusaria. Freyer (pl. 60, fig. *a*) figures Rotundaria as a species under the name of Confinaria. Lastly, Guenée (*Uran. et Phal.* ii. 55) admits Rotundaria as a species with a doubt implied, but suppressed on the assurance that the larva of Rotundaria "had lately been reared in great numbers in England, and was found to be entirely different from that of Pusaria." This passage alludes to a discovery of Mr. Machin's. I have never been so fortunate as to see the larva of Pusaria, but I believe Mr. Machin's view of the entire difference of the larva is now generally accepted.

4. *Eupithecia linariata* and *E. pulchellata*.—The larva of *E. linariata* occurs commonly feeding on the blossoms of *Linaria vulgaris* (the common yellow toad-flax); that of *E. pulchellata* is equally common on those of *Digitalis purpurea* (the foxglove): they are totally distinct, as will be seen by a reference to the detailed descriptions, from the pen of Mr. Crewe, in my 'British Moths.' Guenée considers the perfect insects so similar that he would not have given *Pulchellata* as a species had not Mr. Doubleday informed him that he had bred more than a hundred individuals of *Linariata* without meeting with one of *Pulchellata* amongst them. "It is much to be desired," says M. Guenée, "that *Pulchellata* should be bred simultaneously with *Linariata*, so that we might verify its claim to specific rank, a claim concerning which I have always had my doubts." This has been done, and *Pulchellata* is acknowledged to be a species.

5. *Cidaria immanata* and *C. russata*.—These insects are extremely interesting, not only on account of their infinite variation, but also on

account of the parallelism of their variation; that is to say, each exhibits similar variations, while each has also one or more variations peculiar to itself. A brief sketch of the bibliography of these insects, which are almost ubiquitous, may possess some interest.

In 1776 the Vienna Catalogue gives but one species which can be regarded with any certainty as belonging to the group: this is called *Russata*.

In 1792 Fabricius, in his 'Entomologia Systematica,' also gives one only, which is called *Centum-notata*.

In 1803 Haworth combines these under the name *Centum-notata*, but describes four varieties called α , β , γ and δ ; he also adds four other species, which he calls *Immanata*, of which he describes four varieties, α , β , γ and δ ; *Marmorata*, of which he describes three varieties, α , β and γ ; *Perfuscata*, of which he describes three varieties, α , β and γ ; and finally *Comma-notata*, of which he says "Nunquam variat."

In 1829 Mr. Stephens adds three species, *Concinnata*, *Amænata* and *Saturata*, and Mr. Curtis adds a fourth, *Boreata*.

In 1850 Mr. Doubleday, for the first time, divides this formidable array of names into two species:

RUSSATA including	IMMANATA including
<i>Russata</i> <i>Centum-notata</i>	<i>Immanata</i> <i>Marmorata</i> , as a var.
<i>Comma-notata</i> , as a var.	<i>Amænata</i> , as a var.
<i>Perfuscata</i> , as a var.	
<i>Saturata</i> , as a var.	
<i>Boreata</i> , as a var.	

It will be observed that Mr. Doubleday omits *Concinnata* of Stephens, to which allusion has been made above.

In 1847 Herrich-Schæffer combines these eight described species with four others, *Passeraria*, *Strigulata*, *Truncata* and *Variata*, under the original name of *Russata*, without expressing a doubt as to their constituting but a single species.

In 1857 Guenée endorses this view, giving a long and learned dissertation on the subject; and finally,

In 1862 Mr. Doubleday, in a second edition of his 'Synonymic List,' again separates them, as before, into *Russata* and *Immanata*, and every entomologist in England now follows this master mind and guiding spirit.

Nevertheless much independent and pleasant diversity of opinion obtains in the application of this dichotomous division. On those pleasant evenings when we gather round a friend's cabinet, a discussion like this always arises when the drawer containing *Cidaria russata* is opened for inspection.

1st Critical Visitor. I think these insects are all *Russata*; *Immanata* is a larger insect—it has more the cut of a *Pyrale*, and looks altogether different.

2nd Critical Visitor. I can't agree with you there: *Immanata* is a smaller insect; indeed it seems to me a question of magnitude.

Host. I confess to finding great difficulty in separating them, and to having taken but little trouble about the matter.

3rd Critical Visitor. But I have thought. I think I ought to know the species, if anyone does; I have taken them by thousands. Let me see the drawer. (*Brings his optical focus to bear on the insects.*) You are all wrong here. Ha! ha! ha! I thought as much. In this first row the third, fourth,—no, not the fourth; yes, the fourth,—seventh, eighth and tenth are *Russata*; all the others *Immanata*. Ha! ha! ha! that is a joke! Now for the second row: here they are mixed in the same way; the third, sixth, seventh, ninth, tenth and eleventh are *Immanata*; the rest *Russata*. There is no difficulty in separating them when you once know the species: they are as easy as A B C: ha! ha! ha!

2nd Critical Visitor (taking the drawer and looking over it very intently). I can't agree with you there: I should call the first row all *Russata*, except the third, eighth and ninth—those are *Immanata*; but you have them sadly mixed in the second row. May I take off the glass, and set them right? It's a pity that a cabinet of reference like this should have them wrong.

3rd Critical Visitor. Well, I should not like your naming, Mr. Blank: ha! ha! ha! (*Looks at the drawer again.*) You may be right about the eighth; but I can't give in about the rest. Will you allow me to separate them?

Host. No, thank you: Mr. Doubleday has had the kindness to go through them, and has named them as they stand.

The Critics in chorus. Oh, that's a different thing! Well, I should not have named them so; but of course Mr. Doubleday must be right: no one will dispute his authority.

6. *Dicranura Furcula* and *D. bifida*.

7. *Notodonta dictæa* and *N. dictæoides*.—I believe it possible to separate these two species when in perfect condition; but it is a matter of great difficulty, unless to those who have made the subject their especial study: it seems to me that Haworth was unable to separate them, and that both species are included under his *Bombyx tremula*: the distinction between the two has not been made perfectly clear to my apprehension by the descriptions, yet so early as the time of Linneus two species were recognized, *Bombyx dictæa* and *B. tremulus*; but Haworth combines these names under that of *Tremulus*, and Doubleday under that of *Dictæa*: it is quite possible that it was intended thus to denominate the *N. dictæa* and *N. dictæoides* of our modern nomenclature. Be this as it may, the similarity of the two species is really marvellous, and nothing but a perfect knowledge of their larvæ could induce anyone to separate them: through the kindness of friends I have been supplied with the larvæ of both, and have described them with care; they are abundantly distinct, and cannot be combined, unless by the admission of the hypothesis, hitherto universally rejected, that there may exist permanent variations in the larva parallel to those hitherto supposed to be confined to the imago.

8. *Acronycta Psi* and *A. tridens*.—In this case the exact similarity of the two perfect insects is admitted on all hands. Haworth says of *Tridens*, "Too much like the preceding (*Psi*), and almost the same, but has a different larva." Haworth, however, in attempting their differentiation falls into a very common error: he says, "The colours (of *Tridens*) are always paler; the hind wings are whitish or white:" thus apparently referring to the males of both species. The larvæ are entirely different, and I have taken great pains to describe both from nature.

9. *Noctua festiva* and *N. conflua*.—Here we have a pair which Guenée separates by an intervening species (*Noctua collina*): he makes no allusion to the similarity of the two, but quotes the Vienna Catalogue, Hübner, Haworth, Treitschke and Godart as the authorities for the one; Treitschke, Freyer, Duponchel, Boisduval and Herrich-Schæffer as authorities for the other: I possess a fair series of both; they vary infinitely, and vary almost precisely in the same way, exhibiting similar colours and similar markings in their variation; yet there is no character, so far as I can ascertain, that belongs exclusively to either, and I have never yet met with an entomologist who, after inspecting my series, was perfectly convinced of their distinctness.

Still it appears that Guenée could detect a single specimen in Boisduval's cabinet mixed with his series of *Festiva*. The larva of *Festiva* is figured by Hübner, that of *Conflua* by Millière, and I have had the pleasure of writing descriptions of both: the discrepancies between them convince me they are perfectly distinct, and I believe that I could, without fail, separate a mixed series of the perfect insect into their respective species.

10. *Cucullia Verbasci* and *C. Scrophulariæ*.—Haworth does not appear to me to have been happy in differentiating these two insects; he describes the hind wings of the male *Scrophulariæ* as "albidæ non albæ," and as having the fringe "brown not black." These distinctions certainly are not apparent in my specimens, and Haworth himself seems dissatisfied with them, for he adds, "As the great lepidopterist Hübner gives the water betony moth as a distinct species from that of the mullein, and figures both as above cited, it is here also enumerated, as I possess English specimens of each, and have seen others, but unless they differ more in the larva state than they do in the winged, which is almost a constant characteristic of the section (*Cucullia*), I must still conceive they are not distinct, but very slight variations only; the chief difference is the paler colour of *Scrophulariæ*, whose upper wings, especially in the broad *plaga*, are of an ochraceous colour, as figured by Hübner, while those of *Verbasci* are nearly white in the same part." Guenée, with his usual conscientious painstaking, has endeavoured to differentiate these insects, but has not seized on the characters most insisted on by others. He says, "Les ailes superieures sont moins fortement dentées que chez *Verbasci*, proportionnellement plus large et moins aiguës au sommet. Leur couleur est plus jaune avec les parties foncées d'un brun plutôt noirâtre que ferrugineux; la côte plus cendrée; le côté terminale du triangle foncé, moins net, et n'atteignant pas la 2^{nde} inferieure; les points discoidaux plus marqués et plus nombreux, surtout dans les femelles. Les deux traits subcostaux plus noirs et moins isolées. Les ailes inferieures sont plus clairs, avec le bordure moins fondue. L'abdomen et plus court et plus conique; la partie anterieure du poitrine seulement un peu noirâtre." (*Noctuelites*, ii. 128.) It will be admitted, *nemine contradicente*, that Britain has produced no describing lepidopterist approaching Haworth in knowledge of species or accuracy of description, and that France has none equal to Guenée, and yet it will be seen from the preceding quotations that these most competent men, although carefully pointing out the differences between

these two species, do not perceive the same differences. The "lynx-eyed Haworth" has been unable to observe any of the differences on which Guenée insists, and Guenée, with Haworth's volume in his hand, declines to avail himself of the teaching of that eminent Englishman. My own bred specimens contumaciously ignore the differences laid down by both Englishman and Frenchman, and cannot be divided by any definitions hitherto printed. I confess myself entirely unable to separate the specimens were they mingled, and I doubt the ability of almost any other entomologist to do so. Nevertheless the larvæ of both are thoroughly well known, and differ in food, colour and even in form.

I could multiply instances to almost any extent, but I feel that there is too much of repetition already, and I have said quite enough to satisfy any truth-seeker. It may possibly be objected that by my calling the moieties of these pairs "species" I remove them from the scope of this paper,—namely, variation,—but this difficulty is very trivial: so that the subject is thoroughly ventilated, it matters little what terms we employ. Darwinianism would reduce all species to varieties, and all varieties to mere evolutions, so that precision in terms is almost hopeless, but this branch of the inquiry is open to future investigation.

The substance of this paper was read before the Entomological Society on the 2nd of February, 1857, and elicited the following observations, as reported by Mr. Shepherd, the Secretary (see Zool. 5525):—

"Mr. Stainton observed that the theory of pairs would be completely upset if the list were extended to European Lepidoptera, as there would be found in many instances continental species quite as closely allied to the pairs mentioned as these British species are to each other.

"Mr. Westwood said that he had heard, for the first time, a theory proposed capable, as was asserted, of being tested by the productions of a limited geographical range like Great Britain. He had supposed it to be generally admitted that a knowledge both of existing and extinct forms was requisite for the proposition of natural laws. Was it intended that in each country throughout the world these double species should occur? Was it only in Lepidoptera they were to be looked for? Was it intended that each species should be thus divided, as it were, into two subspecies? Moreover, in the instances cited, it was evident Mr. Newman had adduced relations of analogy,

supposing them those of affinity. No one could support such a theory. Was it intended that each species should be attended by another species intimately allied to it? No one ever doubted such a principle. In the opening part of his paper, Mr. Newman had alluded to the binary divisions of the higher groups, such as Vertebrata and Invertebrata, Ptilota and Aptera, &c.; but in the latter part he had confused these relations (vague as they often were) with the closest possible affinity that could exist in nature, exclusive, of course, of that between individuals of the same species."

Mr. Westwood's profound remarks were received by the Meeting with almost tumultuous approbation: I confess myself unable to see their exact drift, probably owing to my not being sufficiently advanced in the study of affinities and analogies.

Believe me, my dear Mr. Wollaston,

Most faithfully yours,

EDWARD NEWMAN.

PS. My next letter will, I trust, present a little more of novelty, as the subject has scarcely been considered as regards Lepidoptera. I call the letter "Eugenesic Races."

Notes on Aphides. By F. WALKER, Esq., F.L.S.

KNOWLEDGE of the Aphididæ is more difficult of attainment and requires more persevering study than that of any other tribe of insects, on account of their migratory habits and ever-varying forms, and consequent frequent appearance in new aspects. A translation of the latest systematic arrangement of them,* with references to other works on the same subject, may serve as a guide to the investigation of the family.

APHIDIDÆ, *Passerini*.

- A. Antennæ seven-jointed. 1. APHIDINÆ.
 AA. Antennæ six-jointed, at least in the winged form.†

* 'Gli Afidi con un prospetto dei generi ed alcune specie nuove italiane,' par Giovanni Passerini. 1860. 'Aphididæ Italicæ hucusque observatæ,' à J. Passerini, M.D. 1863.

† When the winged form of a genus is known the character of the antennæ is especially to be sought for in this form, for in some genera the apterous form has four-jointed or five-jointed antennæ and the winged form has six-jointed antennæ.—*Passerini*.

- A. Winged form obvious or at least known.
 - A. Cubital vein twice-forked. 2. LACHNINÆ.
 - AA. Cubital vein once-forked or simple. 3. POMPHIGINÆ.
 - AA. Winged form unknown. 4. RHIZOBIINÆ.
- AAA. Antennæ five-jointed or three-jointed.
 - A. Winged form unknown. 5. TYCHEINÆ.
 - AA. Winged form obvious or at least known. 6. CHERMESSINÆ.

1. APHIDINÆ, *Passerini*.

- A. Antennæ on a frontal tubercle.
 - A. Antennæ closely approximate at the base. Front grooved. 1. SIPHONOPHORA.
 - AA. Antennæ remote at the base. Front flat or convex.
 - a. First joint of the antennæ with a tooth on the inner side. . 2. PHORODON.
 - AA. First joint of the antennæ not toothed.
 - a. Nectaries evidently clavate. 3. RHOPALOSIPHUM.
 - aa. Nectaries cylindrical, sometimes hardly attenuated at the base (*Myzus Ribis*), more often incrassated.
 - * Cubital vein twice-forked.
 - † Tail much shorter than the nectaries. 4. MYZUS.
 - †† Tail longer than the nectaries, rarely equal to them in length.
 - 5. HYALOPTERUS.
 - ** Cubital vein once-forked. 6. TOXOPTERA.
 - AA. Antennæ not on a tubercle.
 - A. Seventh joint of the antennæ longer or at least as long as the sixth.
 - a. Antennæ smooth.
 - a. Nectaries longer than thick; or if shorter or none, then the apterous viviparous female with a smooth back.
 - * Nectaries cylindrical, very rarely none (*A. Gallarum*). . 7. APHIS.
 - ** Nectaries clavate. 8. SIPHOCORYNE.
 - aa. Nectaries shorter than thick; or if a little longer than the viviparous apterous female, and the pupa with a hairy back. . 9. MYZOCALLIS.
 - AA. Antennæ pilose.
 - a. Nectaries cylindrical, at least twice longer than thick. . 10. CLADOBIUS.
 - aa. Nectaries tubercle-shaped, much shorter than thick, sometimes almost on a level with the surface. 11. CHAITOPHORUS.
 - AA. Seventh joint of the antennæ shorter than the sixth.
 - A. Aerial species. Winged form very elegant. 12. PTEROCALLIS.
 - AA. Subterranean species. Winged form unknown.
 - a. Third joint of the antennæ longer than the fourth. Hind tarsi with one joint. 13. TRAMA.
 - aa. Third joint of the antennæ as long as the fourth. Hind tarsi two-jointed. 14. PARACLETUS.

Genus 1. SIPHONOPHORA, *Koch*.

Typical species, *Aphis Rosæ*, Linn.—Antennæ on a frontal tubercle, longer than the body; seventh joint setaceous, longer than the sixth.

Front grooved between the tubercles. Nectaries long, cylindrical, slender. Tail generally long, often compressed, falcion-shaped. Legs slender, very long. Wings deflexed. Fore wings with four oblique veins; cubital vein twice-forked.

A. Apterous form green.

A. Nectaries wholly black.

A. Nectaries very long.

a. Border of the abdomen with black points in the winged form. 1. *Rosæ*.

aa. Border of the abdomen without black points in the winged form.

2. *Cyparissia*.

AA. Nectaries moderately long, as long as the tail, or a little longer.

a. Apterous form of one colour. Tail shorter than the nectaries. 3. *Cerealis*.

aa. Apterous form with various spots. Tail as long as the nectaries.

* A continuous green dorsal stripe. 4. *Millefolii*.

** An interrupted green dorsal stripe, formed by triangular spots.

5. *Artemisia*.

AA. Nectaries pale, often green, blackish at the tips, or rarely from the middle to the tips.

A. Apterous form with setigerous dorsal tubercles, which are arranged in longitudinal series. 6. *Avellanæ*.

AA. Apterous form without dorsal tubercles.

a. Tail very short, hardly visible. 7. *Platanoides*.

aa. Tail more or less long, at least equal to one-fourth of the length of the nectaries.

* Nectaries attenuated towards the tips, blackish from the middle.

8. *Ulmariæ*.

** Nectaries black or brown only at the tips.

† Tail less than half the length of the nectaries.

‡ Frontal tubercle with a stout tooth on the inner side. 9. *Solani*.

‡‡ Frontal tubercle sometimes gibbous, but not dentate.

§ Abdomen above smooth, shining. Legs vinous-brownish.

10. *Urticæ*.

§§ Abdomen above transversely rugose, more or less dull. Legs somewhat luteous.

11. *Malvæ*.

†† Tail as long as half the length of the nectaries or longer. Abdomen with pulverulent sutures.

12. *Lactucæ*.

AA. Apterous form brown, or red, or nut-colour, sometimes powdered with white.

A. Tail black.

A. Abdomen brown, powdered with white, with a black dorsal spot.

13. *Absinthii*.

AA. Abdomen red or brownish rust-colour, more or less shining.

a. Tail as long as the nectaries. 14. *Campanulæ*.

aa. Tail shorter than the nectaries.

* Legs luteous; tarsi and tips of the femora and of the tibiæ black.

15. *Solidaginis*.

** Legs black; femora luteous at the base.

16. *Jacæ*.

AA. Tail luteous or lutescent.

A. Body brown or brownish rust-colour.

a. Abdomen above smooth, not tuberculate. 17. *Tussilaginis*.

aa. Abdomen above with tubercles in transverse series.

* Legs black; femora luteous at the base. 18. *Picridis*.

** Legs luteous tarsi and tips of the femora and of the tibiæ black.

19. *Sonchi*.AA. Body deep red. 20. *Tunaceticola*.

1. *S. Rosæ*, Linn.—The apterous form is very often red. It has the greatest development of the peculiar structure of the genus.

2. *S. Cyparissæ*, Koch.—It has not yet been noticed as British. It feeds on *Euphorbia cyparissias* and on *E. peplus*.

3. *S. cerealis*, Kalténbach.—It may be the *Aphis Avenæ* of Fabricius and of Gmelin, but these authors give no description of the species. It is not the *A. Avenæ* of Schrank, and therefore that name, by which I have recorded it, must give place to *granaria*, Kirby, which is prior to *cerealis*, Kalténbach. It has been observed in North America.

4. *S. Millefolii*.—It frequents *Anthemis tinctoria* in addition to the plants that I have mentioned as its food.

5. *S. Artemisiæ*, Fonscolombe.—Passerini observes that the description of *A. Absinthii*, in Ann. Nat. Hist. ii. 202, includes the true *A. Absinthii* as well as this species, which he has found on *Achillea nobilis*.

6. *S. Avellanæ*, Schrank.—It differs much in structure from the other Siphonophoræ, and may be considered as the type of a new genus. It is not generally distributed on the hazel, but sometimes occurs in abundance.

7. *S. platanoides*, Schrank.—The genus *Drepanosiphum*, Koch, to which this species belongs, is very different from Siphonophora in structure and in habits, and the two genera represent two great groups of Aphidinae. *Drepanosiphum* has no viviparous wingless form, the successive annual generations are few, and it does not migrate. Four species have been described, *platanoides*, *acerina*, Wlk., *Tiliæ*, Koch, and *smaragdinum*, Koch. *D. Aceris*, Koch, is a synonym of *D. acerina*. The other group has more development of the peculiar characteristics of Aphididæ: the species are generally migratory, the successive annual generations are more numerous, the wingless viviparous form abounds, and there are more alternate generations: their migrations result from the failure of their food; they then seek new pastures to maintain their existence till they resume the comparatively imperturbable security of the egg state.

9. *S. Solani*, Kaltenbach.—On *Solanum tuberosum* and on *Cydonia vulgaris*. Not recorded as British.

10. *S. Urticæ*, Schrank.—Migration is not so essential to this species as it is to many others. When the weather is mild it continues viviparizing during the winter season without the production of the egg state.

11. *S. Malvæ*, Mosley.—Passerini mentions *Aphis pallida*, *Wlk.*, and *S. Diplantheræ*, *Koch*, as synonyms of this species, and enumerates the following plants as its food:—*Althæa rosea*, *A. narbonensis*, *Nonnea lutea*, *Cuphea*, *Verbena*, *Calceolaria*, *Viola odorata*, *Diplanthera formosa*.

12. *S. Lactucæ*, Schrank?—Passerini observes that this species and *Rhopalosiphum Lactucæ*, *Kaltenbach*, are included in my *A. Lactucæ*. The description of *Kaltenbach* is hardly applicable to it.

13. *S. Absinthii*, Linn.—According to Passerini this is my *A. Absinthii*, exclusive of the synonyms. He mentions *Helichrysum angustifolium* as its food.

14. *S. Campanulæ*, *Kaltenbach*.—On *Campanula rotundifolia* and on *Chrysocoma Linosyris*. Not recorded as British.

15. *S. Solidaginis*, *Fabr.*—Passerini says that my *A. Sonchi* includes this and the following species, as well as *S. Picridis* and the true *A. Sonchi*. Frequents the flowers of *Erigeron acris*.

16. *S. Jaceæ*, Linn.—*A. Cirsii*, *Linn.*, *A. Cardui*, *Fonscolombe*, at least partly, *Siphonophora Artemisiæ*, *Koch*? These are Passerini's references.

17. *S. Tussilaginis*, *Koch*.—This is certainly the species that I have described by the same name. Passerini observes that it deserts *Tussilago Farfara* during the summer.

18. *S. Picridis*, *Fabr.*—Passerini observes that *A. Cichorii*, *Dutrochet*, and *S. Cichorii*, *Koch*, are, in part at least, identical with this species. I have found *S. Cichorii* in June on the shoots of the chicory.

19. *S. Sonchi*, Linn.—According to Passerini, *A. Serratulæ*, *Linn.*, *S. Alliarie*, *Koch*, *S. Achilleæ*, *Koch*, and *S. Lactucæ*, *Koch*, are synonyms of this species. *S. Alliarie* feeds on *Sisymbrium alliaria* and *S. Achilleæ* on *Achillæa millefolium*.

20. *S. Tanaceticola*, *Kaltenbach*.—Passerini says that I have included this species with *S. Absinthii*.

Genus 2. PHORODON, *Passerini*.

Typical species, *Aphis Humuli*, Schrank.—Antennæ on a frontal tubercle; 1st joint furnished on the inside with a stout tooth. Front flat between the antennæ. Nectaries very long, cylindrical or slightly clavate. In other characters like Siphonophora.

- A. Frontal tubercle with a stout tooth.
 - A. Viviparous apterous female pilose; the hairs capitate. Viviparous winged female with a black dorsal spot and with a clavate tail. 1. *Cannabis*.
 - AA. Viviparous apterous female smooth or slightly pilose; the hairs simple. Viviparous winged female with slender brown dorsal bands and with an acute tail. 2. *Humuli*.
- AA. Frontal tubercle not dentate.
 - A. Nectaries cylindrical.
 - A. Viviparous winged female with greenish brown dorsal bands. Nectaries tortuous. 3. *Inulæ*.
 - AA. Viviparous winged female with a large black dorsal spot. Nectaries not tortuous. 4. *Carduinum*.
 - AA. Nectaries clavate. 5. *Galeopsidis*.

1. *P. Cannabis*, *Passerini*.—On *Cannabis sativa*. Not recorded as British.

2. *P. Humuli*, Schrank.—*Passerini* observes that the synonym of Fonscolombe should be excluded from this species. Its history is still incomplete; it migrates from the sloe to the hop, and dwells there for awhile, and is called the hop-fly, and then returns to the sloe. The Aphidinae have a greater capacity for modification than is possessed by other insects, and in the study of them it is requisite that each form should be traced to its cessation or to its succession in the egg state, and that a division should be made between the permanent species and the annual or apparent species whose forms are varied by their migration and food.

3. *P. Inulæ*, *Passerini*.—*Passerini* suspects that in mentioning *Tussilago Farfara* and *T. Petasites* as the food of *P. Galeopsidis*, I have confounded *P. Inulæ* with it. *Aphis Inulæ* ('*Zoologist*,' vii. xlv.—1849) does not belong to this genus.

4. *P. Carduinum*, *Passerini*.—*Passerini* gives a very short description of this species. It appears, as he says, to be identical with my *Aphis Carduina*.

(To be continued.)

Notes from Walton Hall. By GEORGE ROBERTS, Esq.

EARLY in November I had the privilege of visiting the grounds at Walton Hall, and the woodland grave of Charles Waterton. The late residence of the lamented naturalist is, for the present, entirely unoccupied; and the beautiful collection of birds and other curiosities are now, I believe, at the Jesuit College, in Lancashire, where Mr. Waterton was educated, and will remain there, I am informed, till his grandson attains full age. The mansion, park and lake are at present in the care of one or two domestics and a game-keeper.

The readers of the 'Zoologist' will, I am sure, be glad to hear that some of the birds which Mr. Waterton protected and loved so well are still pretty numerous. The Canada geese yet enjoy their food and liberty on the lake: there are now two flocks, one of which is styled the "old flock." The herons breed annually in the wood which is within the wall: when passing through the park I saw one or two flying away from the water to the trees; this was the only opportunity I ever had of observing the heron at home. Kingfishers, dabchicks and moorhens are constantly to be seen at one end of the lake. The moorhens are numerous. Some pochards, mallards and other fowl had arrived on the day of my visit. Mr. Waterton was very scrupulous about the birds when they were newly come and unsettled: no gun was fired, nor trap set. When the water birds are arriving, in October and November, the keeper, who seems to have inherited some of his former master's veneration for the feathered tribes, permits no one to walk on the edge of the lake. The aquatic birds have been disturbed by foxes: a piece of the wall fell soon after the floods of last year, and is not yet rebuilt. The green, the greater spotted and lesser spotted woodpeckers occur in the park. A woodpecker's nest with eggs was taken from a tree, in Haw Park,* a few years ago, by poachers or trespassers, much to the annoyance of Mr. Waterton. Once a green woodpecker took a fancy to roost in one of the galleries of one of the bird-towers. Mr. Waterton used to go of an evening and sit in a grotto, and watch it enter its hole. If, in walking up to the house he should happen to meet any one, he would stop and observe, "I am as pleased as if I had found five pounds; my woodpecker is safe once more." Jays and magpies are not so numerous as they were,

* Haw Park is a wood outside the wall, famous for moths.

having been thinned to permit the increase of game. The hawks are reduced to the sparrowhawk and the kestrel. The carrion crow breeds both within and without the wall. Long strings of rooks fly away from and over Walton, after September, to Nostel Priory to roost now exactly as they did when Mr. Waterton wrote his 'Essays.' (See 'Essays,' vol. i. p. 132.) I once was standing in Walton Lane about dusk in winter, and I saw a vast number of rooks flying over towards Nostel from some place north-west of Walton: they flew in strings, and were above a quarter of an hour in passing over. At Nostel they, along with many jackdaws, roost in a row of large trees, and the clamour and commotion they make before they get settled is said to be really deafening.

In one of the darkest and quietest parts of the valley, at the upper or south end of the lake, lie the remains of Mr. Waterton. I should observe here, for the sake of perspicuity, that the lake is oblong, stretching from north to south, and that the Hall is built at the north end. The sides of the lake at the north end are dotted with trees, but at the other end both sides are covered with trees down to the water's edge. At the upper or southern extremity the water is not deep, being so constructed to favour the wading birds. In furtherance of this design there is also a flat of ground, planted with reeds and strong grass, for the moorhens and other birds to hide and breed in. The whole is hemmed in and shaded by trees. Here in gloom and silence rests the great naturalist. Between two ancient oaks, which grow close to the water and lean over it, stands a stone cross, erected on the spot in Mr. Waterton's lifetime, and behind, set back a little in the wood, is the grave. The mould is raised in the form of a coffin and planted with wild primroses; that is the only protection or covering.* On the plinth or foundation of the cross, close to the ground, on the side facing the water, is an inscription in Latin. The spot where Mr. Waterton hurt himself is marked by a rustic wooden cross, and, singular to say, is only about thirty yards from the grave. In the spring after Mr. Waterton's death, that is to say, the spring of 1866, a magpie built her nest in a tall elm tree which directly overlooks the sepulchre, and in a hole in one of the venerable oaks a "little blue dove" (I give the words as I received them) built her nest and reared her young. "That hole," said my guide, pointing to it, "was planned and made by my good old master for ullato." It is a very large cavity,

* Orders have lately been given for the erection of palisades.

extending upwards from the entrance towards a rotten part where an arm has been blown off. Part of the hole is covered with lead to prevent further rotting, and to darken the interior. This hole has been inhabited by owls as a diurnal retreat for numbers of years. Within a stone's throw, in a secluded nook known to few, the most beautiful of British water-birds, the kingfisher, rears its young year after year. It was in the dusk of a November evening when I visited this singular spot: the moorhens were just discernible, scudding in and out of the reeds; the ring doves were flapping in the tree-tops: the dry leaves were rustling on the ground: I stood a little apart and contemplated the scene with indescribable emotions.

While recrossing the open park I could hear the notes of the jay behind me: the herons were sailing slowly down from the trees to the margin of the water, and ducks were dropping down on to the quiet lake.

It was the delight of Mr. Waterton to promote the pleasure of others. At great expense he provided for the convenience of pic-nic parties; he built an elegant circular temple to sit or dance in, and a cot to make tea in, stables for the horses, grottoes, fountains, rustic chairs, swings and benches for musicians. But now the hilarious laughter of the pleasure-seeker is not heard; weeds are creeping into the walks; rust is tinging the swing-chairs, and moss is coating the rustic chairs: these little things attest forcibly to the loss of a watchful eye and an untiring hand. But I hope, we all hope, that the day is not distant when the gates will be re-opened, the fires re-lighted, and the musicians again take their stand in the shade of the fir-trees.

GEORGE ROBERTS.

Lofthouse, near Wakefield.

Interesting and Extraordinary.—Two of the largest and most ferocious-looking animals of the monkey tribe have just arrived in Liverpool. They are both males and young, being also nearly of a size, the larger standing fully four feet high. They are of very remarkable aspect, having a large lion-like snout or muzzle, with very powerful jaws and formidable teeth. Their limbs are very muscular, and their whole body is covered with a coat of rough shaggy hair, and they evidently possess very great strength and agility. A peculiar sort of comparatively hairless brow, which is at the will of the animal covered by a shaggy kind of caul, contains the eyes, which are large and strikingly piercing and expressive. From their great size and extraordinary conformation the suggestion is at once raised that they are a kind of hybrid between the gorilla and the lion, both of which animals abound in the central portions of Africa,

whence these two specimens were brought.—*Liverpool Courier*. PS. by my Correspondent.—I am reluctant to differ from so high an authority as the 'Courier,' but should rather regard these creatures as gorillas Darwinizing towards lions, and not as hybrids at all. In the "struggle for existence" the carnivore may very possibly be evolved from the frugivore; roots and fruit growing scarce, an appetite for flesh would be set up and the mane and claws of lions developed.—*Liverpool*, December 14, 1867.

A Cat killing a Squirrel.—For the last two years, off and on, we have had two squirrels in our garden, and young ones have also been bred there. We have also many cats, and one of these, about the middle of November, after watching one of the little animals hide up some food for the winter on our lawn, pounced upon it, shook it and killed it, as a dog would a rat, and then ran off with it in its mouth to a considerable distance. Is it not unusual for a cat to kill a squirrel?—*E. Charles Moor; Great Bealings, Woodbridge, Suffolk*, December 16, 1867. [I should not have supposed this an unusual occurrence; but I cannot remember a similar one well authenticated.—*E. N.*]

Large Game of the Kestrel.—On the 28th of November, when strolling over the cliffs near Herne Bay, I disturbed a kestrel at his dinner, which, on examination, I found to consist of a hooded crow: he had eaten all but the skin and head, over which latter he was neatly turning the skin to finish. The eyes of the crow were quite bright, and the bird had evidently not long been dead. In the same field there were many hooded crows feeding quite unconcerned at the presence of the enemy.—*John Hunter; Faversham*, December 16, 1867.

Roughlegged Buzzard near Truro.—I have never yet exactly identified this species in the Cornish Fauna, although it is said to have been seen. Mr. George Copeland, who first recorded the capture of the redbreasted flycatcher, informs me that a rough-legged buzzard, killed at Truro, is now in the Museum of that town.—*Edward Hearle Rodd*.

Diagnostics of the Roughlegged Buzzard.—The female of the common buzzard could not possibly be taken, even at the distance of four hundred yards, for the rough-legged, which has the under parts of a yellowish white, whereas the female of the former species is of a chocolate-brown beneath, and the back of so dark a brown as to appear almost black in the distance; but though so dissimilar in plumage, the female is nearly as large as the roughlegged species. The male of the common buzzard, as I have remarked (*Zool.* 9842), when seen soaring in the distance, is so unlike the female that it might be taken for a bird of a different species, and perhaps mistaken for the roughlegged buzzard, by the casual observer, though of inferior size and wanting the dark brown or black belt, which I agree with Wilson in considering the distinguishing mark in both sexes, though Gould says, the "white root to the tail is." As your correspondent asks my opinion, I will endeavour to give one, though so little being said as to colour of plumage, except the "upper part of the tail being white," (the upper tail-coverts of the male of the common buzzard are *whitish*), it is difficult to do so; however, as neither Lord Clifton nor his gamekeeper noticed the belt, though the bird was inspected by the former through a glass when but one hundred yards off, and was seen by the latter flying close overhead, I cannot but think this bird the male

of the common buzzard, which, being seen so near by the gamekeeper, accounts for its appearing so large, as it is somewhat similar to the roughlegged buzzard in the plumage of the under parts, the ground colour being of a yellowish white; if they again appear, the *belt*, the distinguishing mark, should be looked for: if one is dark beneath, and the other light, they must, if a pair, be the common buzzard; but should they appear of large size, and both birds whitish beneath, they may be set down as the roughlegged species, but then the belt should, with a good glass, be readily made out at some hundred yards off. As to its food, I am inclined to think with Wilson, that, if it preys on ducks, they must be "lame ones," though Mr. Selby has stated that those observed by him "pounced on wild ducks," possibly immature or wounded birds. Those observed in Canada were hawking mice, after the manner of the kestrel; and the one shot had some mice in the œsophagus and the remains of others in the stomach. If usually preying on wild ducks, and other birds, is it not strange that it should have escaped the notice of observers like Wilson and Audubon?—*Henry Hadfield; Ventnor, Isle of Wight, November, 11, 1867.*

Snowy Owl off the Scotch Coast.—A remarkably fine snowy owl was captured alive last Wednesday, on board a small Danish vessel about fifteen miles out at sea from Montrose: it was brought alive, in a seaman's chest, to Mr. Small, birdstuffer, of George Street, Edinburgh, on Saturday evening. Unfortunately I did not see it alive, as Mr. Small, being afraid of it damaging its plumage, killed it. It was very savage, snapping its bill, hissing like a cat, and throwing itself against the sides of its prison. I purchased it of him on Monday. It weighed $4\frac{1}{2}$ lbs.—*John A. Harvie Brown; 130, George Street, Edinburgh, December 17, 1867.*

Variety of the House Sparrow in Berkshire.—On the 21st of November a house sparrow was brought to Mr. Fisher, one of the Eton birdstuffers, with a purely white head; it had, however, no other white feathers about it. This bird was shot near Windsor, but I do not know the exact spot. It is being preserved for a clergyman.—*A. Clark-Kennedy; Eton, Bucks, November 25, 1867.*

Swallows in November.—One of the park-keepers at Windsor told me, a few days since, that he had seen some swallows and martins flying round the Albert Bridge, near Windsor, during the early part of November: I never knew them to remain in this neighbourhood so late.—*Id.*

Curious Variety of the House Martin.—In a birdstuffer's shop at Newton Abbot, on the 12th of November, I saw a very curious variety of the house martin, if it was genuine and not dyed: the rump and tail-coverts were a bright magenta, and the back wing-coverts and some of the quills, especially those nearest the body, were shot or glossed with the same colour, instead of the usual blue; the throat, breast and under parts were also slightly tinged with the same colour. The man declared that it was not dyed, but that it was as it had been brought to him, and that it had been knocked down by a little girl with a stone on the bridge over the Teign near Newton, some time in this summer, and that she had brought it to him immediately after, and he had stuffed it.—*Cecil Smith; Lydeard House, Taunton.*

Late Appearance of the Swallow.—I saw a swallow flying about hawking for flies, over a field near here, on the 28th of November. I also heard of one being seen at Taunton about the same day.—*Id.*

Animal Confidence.—I have been much struck with the confidence in the midst of danger shown by animals at the Kingston Rifle Range: the butt there is formed by a

bank of clay, flanked and surmounted by faggots. Thrushes and sparrows yearly nest and bring up their young in the faggots, in company with rabbits, although all day the bullets are crashing on the target and bank within a few feet of their nests, and sometimes even into the faggots. The six hundred yards firing point is an open wooden shed, about twelve feet square, built on the embankment of a mill-stream, the floor of the shed on the one side resting on the bank and the other supported by piles and rafters: on these rafters, immediately under the floor, a thrush built and reared its brood, and on a ledge under the roof, not more than seven feet from the floor, and quite visible, two swallows' nests were formed; one was deserted after a time; the other reared the young and departed. This little shed was in daily use, yet, notwithstanding the trampling of the men and firing of the rifles, these birds showed no fear.—*J. Hunter; Faversham.*

Ornithological Notes from Scilly.—The shooting party left Trescoe Abbey at the latter part of November with no very great success in their snipe and woodcock bag. The following are some observations made during the month:—A female or young surf scoter was obtained, a low latitude for this arctic duck: I reported an adult male, with its brilliant-coloured bill, had been obtained some time since. A young firecrest was also obtained, with the distinct white mark over the eye, but without any coloured crest. Flocks of stock doves had arrived, and the usual migration of redwings, chaffinches and bramble finches. Siskins had also appeared in considerable numbers, and a male redbacked shrike was observed. It may be remarked that this shrike has been lost sight of in the county for some years, except an occasional specimen.—*Edward Hearle Rodd; Penzance, December 2, 1867.*

Virginian Colin at St. Mary's Cray, Kent.—I beg to inform you that, through the kindness of Mr. W. L. Buster, of St. Mary's Cray, I have a male specimen of the Virginian colin, which was shot by him, on the 25th of last June, in the nursery of Messrs. G. and J. Lane. It was first seen by their foreman on the 23rd of June, and was killed by Mr. Buster two days afterwards, whilst perched in an apple-tree. It was preserved by Mr. Packman, of Orpington, but did not come into my possession until September last, and pressure of business has prevented my sending you a notice of it sooner.—*J. W. Stephenson; 2, Loudoun Place, Brixton Road, November 23, 1867.*

Flight of the Bittern.—We have had a large number of these birds in our district, extending, in fact, to the Scilly Isles, during the week. Some seasons consecutively we never see a single example.—*Edward Hearle Rodd; December 16, 1867.*

Jack Snipe in August.—In the December number of the 'Zoologist' (S. S. 1016), I see September noted as an early date for the appearance of this bird. This year, on the 24th of August, I flushed a jack snipe in some water-meadows close to the town here. When first disturbed it flew lazily for about thirty yards, and then dropped: on putting it up a second time it flew strong and well: it was apparently an adult bird.—*James Shorto, jun.; High East Street, Dorchester, December 14, 1867.*

Longtailed Duck at Exmouth.—During my recent visit to Teignmouth I was fortunate enough to get a specimen of this duck for my collection: it was killed by one of the boatmen at Exmouth, as he was on his way from that place to meet me at Starcross, on the 18th of November. He had seen a small flock of six or seven of the same birds about for a day or two before, and he afterwards told me he had seen one since. The one procured is a young bird of the year.—*Cecil Smith.*

Rednecked Grebe near Nottingham.—A specimen of the rednecked grebe (*Podiceps rubricollis*) was shot on the River Trent, at Shelford, about six miles from Nottingham, on the 17th of October, and came into my possession the same evening: it is in adult plumage, having the red neck and white throat. Although well acquainted with the Ornithology of this district for twenty-five years past, this bird is the first of the species I have met with.—*John S. Hedderly; Sneinton, Nottingham, November 15, 1867.*

Gannet on the Kentish Coast.—At the end of September a man found a gannet, in the plumage of the first year, behind the sea-wall on Whitstable Flats. The bird, although apparently unwounded, was stupid enough to allow himself to be knocked on the head with a stick.—*John Hunter.*

Storm Petrels and other Birds in the Firth of Forth.—On the 13th of November a friend and myself took a boat at Grangemouth, and went down the Firth as far as Queensferry, for the purpose of seeing what wild fowl were yet making their appearance. Amongst the common ducks we observed one pintail drake pass overhead: saw large flocks of scaups and pochards, about a dozen redthroated divers (two of which we wounded and lost, owing to their making to windward, and there being a fresh breeze blowing at the time), one great northern diver, eight Richardson's skuas, which were following the large companies of gulls, which, in their turn, were feeding on the sprats which had lately made their appearance. Besides the above we saw some eight storm petrels, three of which we shot: some of these were close to Grangemouth. The weather was fine, with a little wind from the south-west. The petrels were in poor condition, as were several others killed near Aberdeen, which I saw two days ago in the shop of Mr. Small, birdstuffer, Edinburgh. A blacktailed godwit was also obtained near Leith lately. Dunlins seem this season to be unusually abundant on this coast. At a right and left discharge of a 15-gauge shoulder-gun I killed one day some sixty dunlins on the breakwater at Grangemouth. The flocks are very large and numerous. Out of seventy dunlins, killed one day in October, only one had a buffish breast and a longer bill and longer legs than the rest: it closely resembled the curlew sandpipers which I before gave you notice of. The disparity in length of bill of many of the dunlins I have shot this season, and the unusual length of it in others, is very remarkable. Is this occasioned by age, sex, or local difference in breeding stations, or to what other cause, if any, can it be assigned? There is every appearance here of an early winter. Teal are coming inland in greater numbers and earlier than I have hitherto observed them; but as yet I have killed but few mallard at flight time. Woodcocks, as usual, arrived with the first hard frost, about a week ago. Fieldfares are arriving in large flocks. At the beginning of the frost large flocks of golden plovers came far inland, but were very wild and difficult of approach.—*John A. Harvie Brown; Dunipace, Falkirk, November 23, 1867.*

Storm Petrel at Bridlington Quay.—Mr. J. H. Gurney very kindly forwarded me a fine specimen of this little petrel yesterday: it was shot, on the 12th of November, at Bridlington Quay, Yorkshire. Mr. Gurney does not state whether there were more birds in company with this one, nor does he give further particulars.—*A. Clark-Kennedy; Eton College, November 15, 1867.*

Forktailed Petrel at Colchester.—On or about Thursday, the 5th of December, a boy connected with the Great Eastern Railway was rubbing up one of the engines, at five o'clock in the morning, at the Colchester station, when a bird flew against his lantern with great force, and, being stunned, was of course easily captured. It was

blowing strongly at the time, and I need not say that the gales during the week November 30—December 7 will long be remembered in every part of England. This bird was killed, and sent to Mr. Ambrose, of this town, for stuffing, where I saw it, and recognized it at once as Leach's or the fork-tailed petrel (*Thalassidroma Leachii*). It has been purchased for me by Mr. Ambrose, and is added to my collection. Like its congener, the storm petrel, this bird is frequently taken in England during or after strong gales, Yarrell says more frequently in the autumn. They are carried inland, and generally fly to light when captured. I have a storm petrel taken in this way twenty-five years ago, twenty miles from the sea.—*C. R. Bree; Colchester, December 10, 1867. —From the 'Field.'*

Forktailed Petrel near Spalding.—I have this last fortnight received two forktailed petrels; both were alive when caught, but only lived a few days. I believe they are male and female, as they differ slightly in plumage and size. I have never heard of any being caught in this neighbourhood before. Both are being preserved by Mr. Evans, of Bourn.—*J. W. Harrison; Broad Street, Spalding.—Id.*

[Many instances of the occurrence of petrels inland have been recorded in the daily papers, but most of them are unauthenticated by a name.—*E. N.*]

Large Pike in Buckinghamshire.—On the 28th of September last a large pike was caught upon a "triomel" on the ornamental water at Ditton Park, the seat of his grace the Duke of Buccleuch. This fish weighed 20½ lbs., and had a very large head in comparison with its body: the head was preserved by Mr. Fisher, of Eton.—*A. Clark-Kennedy.*

Monster Eel.—On Tuesday an eel of immense size was shown at Mr. Culling's, fishmonger, of Downham Market, which was taken out of the River Ouse, near Denver Sluice: it measured in length 5 feet 8 inches, girth 17¼ inches; and weighed 36 lbs. (28 lbs. after being cleansed). Yarrell, in his 'British Fishes,' mentions having seen the skins of two at Cambridge which together weighed 50 lbs. (one 27 lbs. and the other 23 lbs.), which were taken within a few miles of the spot where this was captured. The party who secured it left for Cambridge with their prize, and obtained at Ely upwards of £3 by showing it. Ely is said to have obtained its name from rents in the isle being paid in eels. The lords of the manors in the isle were annually entitled to upwards of 100,000 eels—not, we presume, of this monster size.—*From the 'Times' of October 28, 1867.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

November 18, 1867.—Prof. WESTWOOD, Vice-President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Journal of the Linnean Society,' Zoology, Vol. ix. No. 37; and 'Proceedings of the Linnean Society;' presented by the Society.

Election of Subscribers.

Frederick Bates, Esq., of Leicester, and H. J. S. Pryer, Esq., of Highgate, were severally ballotted for, and elected Annual Subscribers.

Exhibitions, &c.

Mr. Bond exhibited eight specimens of *Sterrhia sacraria*, bred from the egg by Mr. Rogers, of Freshwater, Isle of Wight; together with two females by which the eggs were laid. One of the females was captured at midday on the 14th of August, 1867, and on the 16th laid three eggs; the other was taken at sugar on the 16th of August, and on the 19th laid six eggs. All the nine eggs were hatched on the 23rd and 24th of August, and the larvæ were fed on *Polygonum aviculare*. On the 14th of September three larvæ began to spin up, on the 19th four more, and on the 23rd the remaining two. The moths emerged, one on the 17th of October, two on the 19th, three on the 25th, and two on the 27th; one died in pupa. The times of development in the cold and wet season of 1867 thus agreed very nearly with those of the specimens bred by Mr. Hellins in the hot and dry season of 1865, and described by Mr. M'Lachlan (see *Trans. Ent. Soc.* 3rd series, vol. ii. p. 453, pl. xxiii. figs. 2—7), and the food-plant was the same; but the specimens now exhibited were unlike Mr. Hellins's specimens, being all of the same pattern, plain, buff-coloured, but very dark.

Mr. M'Lachlan mentioned that this species, which was originally described by Linnæus from specimens captured in Barbary, and which was extremely abundant at the Cape of Good Hope, had been found as far north as Perthshire.

Mr. Stainton exhibited a specimen of *Ebulea catalaunalis*, a new British *Pyralis*. It was captured at Cheshunt on the 18th of September last, by Mr. W. C. Boyd, whose attention was attracted by its peculiar flight, resembling that of a house-fly. The insect was quite distinct from *Nascia ciliaris*; but in consequence of Stephens having erroneously given *catalaunalis* as a synonym of *ciliaris*, continental authors were in the habit of quoting the latter insect as identical with *catalaunalis*.

Mr. Higgins exhibited a large collection of butterflies from Labuan and Borneo; amongst them were *Ornithoptera Brookiana*, *Prothoe Calydonia*, *Amathusia*, &c., &c., and several species hitherto unique among Mr. Wallace's captures.

Mr. Trimen exhibited a fine species of *Papilio* from Uruguay, allied to *P. Americus* of Kollar.

Prof. Westwood had recently received from Dr. Hooker the cocoon and chrysalis of a *Saturnia*, from the larva of which the Chinese obtained the "gut" used by fishermen: the moth was not yet known, but he hoped to breed it. The "gut" was in fact the silk-reservoir of the larva, which was drawn out about twenty-four hours before the larva would in the ordinary course begin to spin, the precise time being of great importance; it was dipped first in vinegar, then in water, after which the silk-vessel was capable of being extracted in many cases to the length of from twenty to thirty feet.

Mr. Janson said that in the South of Europe "gut" was obtained from the common silkworm.

Prof. Westwood added that one of the *Saturnia* cocoons contained a *Chalcis* and another Hymenopterous parasite, but the pupa was nevertheless quite perfect.

Mr. M'Lachlan mentioned that Dr. Balbiani had recently called the attention of the Soc. Ent. de France to the facility with which the silkworm disease might be communicated to the healthy larvæ of other Lepidoptera. He had taken larvæ of the same brood of *Bombyx neustria*, and fed some upon healthy leaves of *Scorzonera*, others upon leaves of the same plant, which he sprinkled with water in which diseased silkworms had been pounded; the former were healthy and well developed, the latter were small, soon filled with corpuscles, and died at the first moult. Dr. Balbiani had also inoculated with muscardine the larvæ of clothes-moths, by throwing on the infested clothes a powder formed of the *débris* of muscardined silkworms; the infection being more rapid and certain when the powder was fresh, less so when dried.

Mr. Stainton had to record a new habitat for the larva of a *Tinea*; Mr. Swanzy had shown him the larva-case of a *Tinea* which was taken from the horn of a kooloo from Natal, and there could be little doubt that the larva must have been burrowing in the horn of the living animal.

Mr. Swanzy added that, since Mr. Stainton's visit, he had found a living larva in the horn.

Mr. Trimen had seen the skull of a hartebeest, the base of which was eaten by what he had no doubt was the larva of a *Tinea*.

Mr. Trimen exhibited a grasshopper of the genus *Pæcilocerus*, of which he had found the pupæ *in copulâ*: it was not an isolated case, but he had seen hundreds of pairs of the nymphs at Natal at the beginning of the present year.

Mr. Trimen exhibited a Mantis with minute fore legs, remarkable for its resemblance to a *Phasma*.

Mr. Bates remarked that its likeness to a *Bacillus* was very close, and suggested that it would be found to feed upon *Bacillus*, which, deceived by the imitation of its own form, would fall an easy prey to the Mantis.

Mr. M'Lachlan reported that *Boreus hyemalis* had been lately taken by Messrs. Douglas and Scott, amongst moss, near Croydon.

December 2, 1867.—Sir JOHN LUBBOCK, Bart., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—
 'Proceedings of the Zoological Society,' 1867, Part ii.; presented by the Society.
 'Descriptions of American Lepidoptera,' No. 2, by A. R. Grote and C. T. Robinson; by the Authors.
 Newman's 'Illustrated Natural History of British Moths,' No. 12; by the Author.
 'The Zoologist' for December; by the Editor.
 'The Entomologist's Monthly Magazine' for December; by the Editors.
 Also, a portrait of Lyonet; by H. Hartogh Heys v. d. Lier.

The following additions, by purchase, were also announced:—
 'British Moths,' Nos. 1—5; 'Genera des Coléoptères d'Europe,' Livr. 136.

Election of Members.

W. C. Boyd, Esq., of Cheshunt; Herbert Druce, Esq., of Ealing; A. H. Hali-day, Esq., of Carnmoney, County Antrim; and Joseph Ince, Esq., of 26, St. George's Place, S.W.; were severally ballotted for, and elected Members.

Exhibitions, &c.

Mr. Pascoe exhibited a new species of *Thysia* from Sumatra, which he proposed to describe under the name of *T. viduata*; and pointed out that *T. tricineta* of Laporte, from Java, was distinct from *T. Wallichii* of Hope, from Upper India.

Mr. Pascoe also exhibited several other interesting Coleoptera, including new forms of *Trogositidæ* from Penang, of *Tenebrionidæ* from Ceylon, Sumatra and N'Gami, of *Brenthidæ* from Batchian, of *Curculionidæ* from Peru, of *Anthribidæ* from the Philippine Isles and Malacca, and of *Lamiidæ* from Java and Malacca.

Prof. Westwood exhibited the only known British specimen of *Serropalpus striatus*, captured some years ago in Leicestershire. It was the identical insect recorded in the 'Zoologist' for 1844, p. 701.

Prof. Westwood also exhibited a small spherical nest, made of mud, with a white silken casing inside; it was found on the common ling near Reigate, in July, 1866, on the occasion of the Society's visit to Mr. W. Wilson Saunders, and was then thought to be the nest of a spider. It had, however, produced the hymenopterous *Eumenes atricornis*:

Mr. F. Smith remarked that the *Eumenes atricornis* of Curtis was the coarctatus of Linnæus; he had found many of the females at Bournemouth, carrying off a Lepidopterous larva (probably *Eupithecia nanata*) which fed upon ling. It was an error to suppose that the larvæ of *Eumenes* were fed upon honey.

Mr. F. Smith exhibited a piece of dead willow-wood found at Mitcham, in which were no less than ten cocoons of *Megachile Willughbiella* within a radius of an inch. The burrows or perforations in the wood were lined with rose-leaves, but the same species of leaf-cutting bee did not always confine itself to the same kind of leaf—rose, elm, laburnum, and others were used; in one instance he had known them to use lilac-leaves, and he believed that they would take almost any leaf that happened to grow near the nest. Some species made an inner lining of a different kind of leaf from the outer coating; he had known *Megachile argentatus* to form an inner lining of the petals of *Lotus corniculatus*, and *M. centuncularis* of the petals of the scarlet geranium.

Papers read.

The following papers were read:—

"Contributions to a Knowledge of the Coleoptera," part 1; by Mr. Pascoe.

"On some Undescribed Species of South-African Butterflies, including a new Genus of *Lycænidæ*;" by Mr. Roland Trimen. Eighteen new species were exhibited and described, including two species of *Papilio*, an *Acræa*, a *Panopea*, a *Deloneura* (n. g.), three species of *Zeritis*, an *Aphnæus*, four *Lycænæ*, a *Pyrgus*, two *Cyclopidæ*, and two *Pamphilæ*.

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New Part of 'Transactions.'

The publication was announced of *Trans. Ent. Soc.*, 3rd series, vol. iv. part 3; being the fifth Part issued during 1867.—*J. W. D.*

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